

What is claimed is:

1. A method for locating position comprising:  
receiving satellite telemetry data from all of the  
satellites in a global positioning system constellation of  
satellites;  
communicating the received satellite telemetry data to  
a central processing site;  
propagating selected satellite telemetry data to a  
mobile receiver; and  
acquiring at least one satellite signal at said mobile  
receiver using said selected satellite data.
2. The method of claim 1 wherein the selected satellite  
telemetry data comprises the ephemeris data for each  
satellite in view of the mobile receiver.
3. The method of claim 2 wherein the selected satellite  
data comprises a pseudo-range model, derived from the  
ephemeris data, that represents a relative position of each  
satellite in view of the mobile receiver.
4. The method of claim 2 wherein the selected satellite  
telemetry data comprises a Doppler measurement derived from  
the satellite ephemeris data.
5. The method of claim 1 wherein said acquiring step  
further comprises:  
using the selected satellite telemetry data to narrow  
a frequency uncertainty and a code uncertainty.
6. The method of claim 1 wherein said receiving step is  
accomplished using four satellite signal receivers.

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9. The method of claim 7 wherein said computing step is  
10 performed at a location that is remote from said mobile  
receiver.

20 11. The method of claim 10 wherein said at least one  
acquired satellite signal is used to generate a clock and a  
correlator delay offset.

12. The method of claim 10 wherein said at least one  
25 acquired satellite signal is used to improve an estimated  
pseudo-range computation for satellite signals having low  
signal strength.

13. A method for locating position comprising:  
30 receiving satellite telemetry data from a plurality of  
the satellites in a global positioning system constellation  
of satellites;

communicating the received satellite telemetry data to  
a central processing site;

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35/         deriving a pseudo-range model comprising a pseudo-
range, a pseudo-range rate and a pseudo-range acceleration;
propagating the pseudo-range model to a mobile
receiver; and

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14. The method of claim 13 wherein said acquiring step further comprises computing Doppler from said pseudo-range model.

16. The method of claim 13 wherein the pseudo-range model is derived from satellite telemetry data comprising ephemeris data for each satellite in view of the mobile receiver.

17. The method of claim 16 wherein the satellite telemetry data comprises a Doppler measurement derived from the satellite ephemeris data.

18. The method of claim 13 wherein said acquiring step further comprises:

using the pseudo-range model to narrow a frequency uncertainty and a code uncertainty.

19. The method of claim 13 wherein said receiving step is accomplished using four satellite signal receivers.

20. The method of claim 13 further comprising:  
30 computing a position of said mobile receiver using  
said pseudo-range model.

21. The method of claim 20 wherein said computing step is performed within the mobile receiver.

22. The method of claim 20 wherein said computing step is performed at a location that is remote from said mobile receiver.

Station	Time	Lat.	Long.	Alt.	Wind	Temp.	Hum.	Press.	Clouds	Remarks
111111	0000	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0100	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0200	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0300	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0400	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0500	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0600	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0700	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0800	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	0900	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1000	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1100	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1200	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1300	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1400	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1500	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1600	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1700	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1800	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	1900	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	2000	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	2100	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	2200	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111
111111	2300	11° 11' N	111° 11' E	111	111	11.1	11.1	11.1	111	111

5        using the at least one acquired satellite signal to  
aid in receiving other satellite signals having low signal  
strength.

24. The method of claim 13 wherein said at least one  
10 acquired satellite signal is used to generate a clock and a  
correlator delay offset.

25. The method of claim 13 wherein said at least one  
acquired satellite signal is used to improve an estimated  
15 pseudo-range computation for satellite signals having low  
signal strength.

26. Apparatus for locating a position of a mobile receiver comprising:

20 a plurality of satellite signal receivers for  
receiving satellite signals from all satellites in a  
constellation of global positioning satellites;

25 a communications network, coupled to each of said  
satellite signal receivers in said plurality of satellite  
signal receivers;

a satellite data processor, coupled to said communications network; and

a mobile receiver, coupled to said satellite data processor.

30 27. The apparatus of claim 26 wherein said communications network comprises three or more satellite signal receivers.

28. The apparatus of claim 26 further comprising  
35 a wireless network for communicating said satellite  
data to said mobile receiver.

[illegible]

29. The apparatus of claim 26 wherein said satellite data processor generates a pseudo-range model for each mobile receiver and communicates the pseudo-range model to the mobile receiver.

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30. The apparatus of claim 26 wherein said plurality of satellite signal receivers are positioned to receive telemetry data from each and every satellite in a satellite constellation.

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31. The apparatus of claim 23 wherein said satellite constellation is a global positioning system (GPS) satellite constellation.

15 32. Apparatus for providing satellite data to a mobile receiver comprising:

a plurality of tracking stations for receiving telemetry data from satellites; and

20 a communication network for propagating the telemetry data from all the satellites to a data processor.

33. The apparatus of claim 32 wherein said data processor transmits said data to a mobile receiver.

25 34. The apparatus of claim 32 wherein said data processor produces a pseudo-range model using said telemetry data.

35. The apparatus of claim 32 wherein the plurality of tracking stations comprise at least three stations.

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36. A method of receiving global positioning system (GPS) satellite signals comprising:

receiving satellite ephemeris at a first location;

35 communicating the satellite ephemeris to a mobile GLS receiver at a second location; and

processing satellite signals received at the mobile GPS receiver using the ephemeris to reduce code and

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frequency uncertainty in the mobile GPS receiver to improve acquisition sensitivity of the mobile GPS receiver.

~~37~~. The method of claim ~~36~~ wherein said communicating step  
5 is performed through a wireless path.

38. The method of claim 35 further comprising generating a pseudo-range model from said satellite ephemeris and communicating the pseudo-range model to the mobile receiver.

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	0°	15°	30°	45°	60°	75°	90°	105°	120°	135°	150°	165°	180°	195°	210°	225°	240°	255°	270°	285°	300°	315°	330°	345°	360°	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0007	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0014	0.0015	0.0016	0.0017	0.0018	0.0019	0.0020	0.0021	0.0022	0.0023	0.0024	0.0025	0.0026
0.0002	0.0002	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	0.0030	0.0032	0.0034	0.0036	0.0038	0.0040	0.0042	0.0044	0.0046	0.0048	0.0050	0.0052
0.0003	0.0003	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024	0.0027	0.0030	0.0033	0.0036	0.0039	0.0042	0.0045	0.0048	0.0051	0.0054	0.0057	0.0060	0.0063	0.0066	0.0069	0.0072	0.0075	0.0078
0.0004	0.0004	0.0008	0.0012	0.0016	0.0020	0.0024	0.0028	0.0032	0.0036	0.0040	0.0044	0.0048	0.0052	0.0056	0.0060	0.0064	0.0068	0.0072	0.0076	0.0080	0.0084	0.0088	0.0092	0.0096	0.0100	0.0104
0.0005	0.0005	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0075	0.0080	0.0085	0.0090	0.0095	0.0100	0.0105	0.0110	0.0115	0.0120	0.0125	0.0130
0.0006	0.0006	0.0012	0.0018	0.0024	0.0030	0.0036	0.0042	0.0048	0.0054	0.0060	0.0066	0.0072	0.0078	0.0084	0.0090	0.0096	0.0102	0.0108	0.0114	0.0120	0.0126	0.0132	0.0138	0.0144	0.0150	0.0156
0.0007	0.0007	0.0014	0.0021	0.0028	0.0035	0.0042	0.0049	0.0056	0.0063	0.0070	0.0077	0.0084	0.0091	0.0098	0.0105	0.0112	0.0119	0.0126	0.0133	0.0140	0.0147	0.0154	0.0161	0.0168	0.0175	0.0182
0.0008	0.0008	0.0016	0.0024	0.0032	0.0040	0.0048	0.0056	0.0064	0.0072	0.0080	0.0088	0.0096	0.0104	0.0112	0.0120	0.0128	0.0136	0.0144	0.0152	0.0160	0.0168	0.0176	0.0184	0.0192	0.0200	0.0208
0.0009	0.0009	0.0018	0.0027	0.0036	0.0045	0.0054	0.0063	0.0072	0.0081	0.0090	0.0099	0.0108	0.0117	0.0126	0.0135	0.0144	0.0153	0.0162	0.0171	0.0180	0.0189	0.0198	0.0207	0.0216	0.0225	0.0234
0.0010	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080	0.0090	0.0100	0.0110	0.0120	0.0130	0.0140	0.0150	0.0160	0.0170	0.0180	0.0190	0.0200	0.0210	0.0220	0.0230	0.0240	0.0250	0.0260
0.0011	0.0011	0.0022	0.0033	0.0044	0.0055	0.0066	0.0077	0.0088	0.0099	0.0110	0.0121	0.0132	0.0143	0.0154	0.0165	0.0176	0.0187	0.0198	0.0209	0.0220	0.0231	0.0242	0.0253	0.0264	0.0275	0.0286
0.0012	0.0012	0.0024	0.0036	0.0048	0.0060	0.0072	0.0084	0.0096	0.0108	0.0120	0.0132	0.0144	0.0156	0.0168	0.0180	0.0192	0.0204	0.0216	0.0							

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